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**Purpose/Objective:** Here we report the prospectively documented short- and long-term health-related quality of life (HRQoL) of a large cohort of patients with advanced laryngeal cancer. The patients were treated in a randomized trial comparing accelerated radiotherapy with carbogen and nicotinamide (ARCON) against accelerated radiotherapy alone (AR).

**Materials and Methods:** Of 345 patients with cT2-4 laryngeal cancer, 174 were randomly assigned to AR and 171 to ARCON. HRQoL was assessed using the European Organisation for Research and Treatment of Cancer (EORTC) QoL Questionnaire-C30 (QLQ-C30) and the Head&Neck cancer module (QLQ-H&N35) at baseline, at completion of radiotherapy and at 6, 12, and 24 months post-baseline. Tumor- and patient related factors with potential impact on quality of speech and swallowing were analyzed separately. Data were analyzed two years after inclusion of the last patient.

**Results:** Compliance with completion of questionnaires at different time-points was high (AR: 60-79%; ARCON 70-81%). Significant clinical impact (>10 effect-points) was observed for nearly all items of the QLQ-C30 and QLQ-H&N35 between baseline and end of treatment. At 6 months, scores returned to baseline level for all items with exception of dry mouth, sticky saliva, taste- and smell perception. No difference in HRQoL score between AR and ARCON was observed at any of the time points. The rate of patients reporting 'quite a bit' or 'very much' complaints of dry mouth, sticky saliva, or changes in taste- and smell perception for AR vs ARCON is limited to 26% vs 33%, 20% vs 23% and 20% vs 17% at 2 years, respectively. At 2 years from diagnosis, the majority of patients treated by AR vs ARCON, have 'not at all' or 'a little' complaints of swallowing (77% vs 81%;  $P=.37$ ) or speech (64 vs 63%,  $P=.51$ ). Long-term function of speech and swallowing for patients presenting with T4 tumors was not impaired compared to T2-T3 tumors. The use of a feeding tube at 2 years from diagnosis was limited to 6% vs 4% of AR vs ARCON patients, respectively.

**Conclusions:** With ARCON, a high local control ( $\pm 80\%$ ) and a significantly improved regional control rate are observed while maintaining excellent speech and swallowing function for the majority of patients, independent of T-stage. Long term dry mouth, sticky saliva and changes in taste and smell perception are limited to one quarter of patients and not different between both treatment arms.

#### PD-0050

**Predictors and patterns of regional recurrence following lung SBRT: A report from the Elekta Lung Research Group**

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**Purpose/Objective:** To determine the predictors and patterns of regional recurrence in patients treated with stereotactic body radiotherapy (SBRT) for primary lung cancers.

**Materials and Methods:** Patients with primary lung cancer treated with SBRT were identified from a multi-institutional (5) database of 965 cases. Patients with previous lung cancer or multiple lung tumors (231) were excluded leaving 734 analyzable patients. Details of patient factors, treatment specifics, toxicity and clinical outcomes were extracted from the database. All events were calculated from the end of radiotherapy. Estimates of local (LR), regional (RR), and distant recurrence (DR) were calculated using the competing risk method. Cause specific (CSS) and overall survival (OS) were calculated using the Kaplan-Meier method. Details of locations and number of simultaneous regional failures were categorized by lymph node (LN) anatomic level.

**Results:** The median follow-up time was 1.4 years (0.1-14.8 years). The median age was 76 years (42-94), 367(50%) were male, 644 (88%) tumors were peripheral per RTOG 0236 and 43 (6%) had mediastinal staging with EBUS/mediastinoscopy. Tumor location was right upper lobe (RUL) 235 (32%), right middle lobe (RML) 52 (7%), right lower lobe (RLL) 86 (12%), left upper lobe (LUL) 260 (35%), left lower lobe (LLL) 79 (11%) and missing 21 (3%). All patients had a staging PET scan. The median maximum tumor dimension was 2.3cm (0.7- 8.5cm). 476 had pathological proven cancer. The median RT dose was 54 Gy (18-64) and the median number of fractions was 3 (1-10). There were 64 RR. The 2 and 5 year recurrence rates were LR 5.6% and 8.3%, RR 9.0% and 13.4%, and DR 14.6% and 19.0% respectively. On univariable analysis (UVA) tumor dimension ( $p=0.3$ ), tumor baseline SUV ( $p=0.1$ ), histology ( $p=0.3$ ), RT dose ( $p=0.5$ ), tumor location ( $p=0.8$ ) and gender ( $p=0.6$ ) were not correlated with RR. On the biopsy proven cohort ( $n=476$ ) the 2 and 5 year recurrence rates were LR 7.6% and 11.0%, RR 9.5% and 12.9%, and DR 17.9% and 21.5% respectively. On UVA tumor baseline SUV ( $p=0.03$ ) was correlated with RR. There were 181 simultaneous sites of RR. 16 patients had single station RR in station 12R (1RUL), station 10R (2RUL, 2RLL), station 10L (1LLL), station 7 (2RUL, 2RLL, 1 LLL), station 4R (1RUL, 1RLL), station 2R (1RUL) and station 5 (1LLL). The pattern of LN failure was station 10  $n=23$  (13%), station 7  $n=70$  (39%), station 4  $n=25$  (14%), station 2  $n=10$  (6%) and other stations  $n=53$  (29%). The most common RR levels were stations 4 & 7 for RUL and LUL, stations 4, 5, 7 & 10 for LLL tumors and stations 7&10 for RML and RLL tumors.

**Conclusions:** Baseline SUV is correlated with RR. Stations 10, 7 and 4 were most common stations for RR. These patterns of recurrence may guide nodal staging procedures prior to SBRT.

#### PD-0051

**Patterns of re-treatment with radiotherapy within a well-defined catchment area**

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